REMARKS

This Amendment is filed in response to the Office Action mailed on June 12, 2008. All objections and rejections are respectfully traversed.

Claims 1, 3-4, 6-8, 10-14, 22, and 24-25 are currently pending.

Claim Rejections – 35 US.C. §112

At paragraphs 4-5 of the Office Action, claims 1-4, 6-13, and 22-25 were rejected under 35 U.S.C. § 112, second paragraph.

Applicant has amended the claims to specifically state which components of the fuel cell are held in compression by the moldable material without using screws or nuts. Accordingly, the claims are believed allowable over the §112, rejection.

At paragraph 6 of the Office Action, claim 24 was rejected under 35 U.S.C. § 112, second paragraph.

Applicant has amended the claim to remove the cited limitation, therefore the rejection is moot.

Claim Rejections – 35 US.C. §103

At paragraphs 7-8 of the Office Action, claims 1-4, 7, 10-14, 22, 24, and 25 were rejected under 35 U.S.C. §103 as being unpatentable over Pflaester, US Published Application No. 2003/0235744 hereinafter Pflaester, in view of Fuglevand et al., US Patent No. 6,030,718, hereinafter Fuglevand.

At paragraph 11 of the Office Action, claims 9 and 23 were rejected under 35 U.S.C. §103 as being unpatentable over Pflaester, in view of Fuglevand, and in further view of Roche et al., US Patent No. 5,079,104, hereinafter Roche.

Applicant's invention as set forth in representative claim 1, comprises in part:

> 1. A method of fabricating a membrane electrode assembly for use in a fuel cell, comprising:
>
> (A) providing a mold that includes a first and second mold plate adapted to impart a desired shape to induce compression to decrease the thickness of components in the mold and to apply pressure substantially evenly across an entire active area of a membrane electrode assembly being fabricated in the mold;
>
> (B) providing a lead frame, including at least a first lead frame component that is adapted to be received into said mold, wherein the first lead frame component includes a current collector;
>
> (C) assembling a protonically conductive membrane with catalyst coatings on each of its major surfaces onto said first lead frame component;
>
> (D) ***integrating the current collector into said first lead frame component onto which said membrane is placed***;
>
> (E) ***placing said lead frame containing said membrane into the mold, wherein the lead frame is designed to use the current collector to protect the protonically conductive membrane and active areas of the diffusion layers of the fuel cell while the molding process takes place***;
>
> (F) compressing said second mold plate onto said first mold plate;
>
> (G) introducing a moldable material in communication with said mold plates;
>
> (H) allowing the moldable material to cure in said mold to solidify and form a plastic frame around said membrane to produce a membrane electrode assembly for use in a fuel cell, wherein the plastic frame holds components of the fuel cell in compression without using screws and nuts, wherein the components are the protonically conductive membrane, the current collector, and diffusion layers of the fuel cell; and

(I) ***trimming away exterior frame portion of the lead frame to only leave current collector portion of the lead frame.***

By way of background, Pflaester discloses a sealing arrangement for fuel cells that includes two separator plates, membrane electrode assembly (MEA). The MEA is set back from the lateral surfaces of the cell separator plates that create a sealing gap. An elastic sealing element encloses the separator plates and a sealing strip extends into the sealing gap to form a gas-tight seal. Additionally, end plates and tie bolts hold together the stack or fuel cell. (Paragraph 0046)

Fuglevand discloses a proton exchange membrane fuel cell power system that includes a plurality of fuel cell modules. Each module includes a pair of current collectors, with each current collector on opposite sides of the MEA.

Roche discloses that during pressing operation to create the fuel cell, barrier members will be extruded out of the interface. The excess extruded material may need to be trimmed after completion of the pressing operation.

Applicant respectfully urges that Pflaester, Fuglevand and Roche, taken alone or in any combination, do not teach or suggest Applicant's claimed novel ***integrating the current collector into said first lead frame component onto which said membrane is placed***; ***placing said lead frame containing said membrane into the mold, wherein the lead frame is designed to use the current collector to protect the protonically conductive membrane and active areas of the diffusion layers of the fuel cell while the molding process takes place***; ***trimming away exterior frame portion of the lead frame to only leave current collector portion of the lead frame***. In further detail, in Applicant's

claimed invention a lead frame component has an integrated current collector. The lead frame is designed to use the current collector to protect the protonically conductive membrane and active areas of the diffusion layers of the fuel cell while the molding process takes place. (pg 13, lines 15-18). Additionally, the current collector can act as a compression plate within the fuel cell. (pg 7, lines 1-4). Furthermore, the lead frame is used for placing the current collector, membranes, diffusion layers, and other layers in the mold. The lead frame is trimmed away after the molding process completes to only leave the current collector portion remaining in the finished fuel cell. In other words, the lead frame component is a temporary structure (except the current collector) for use in assembling the fuel cell, placing the fuel cell in the mold, and molding material around the fuel cell.

In contrast, Roche merely discloses trimming off extra extruded material formed during the pressing operation. Applicant's invention is trimming away the lead frame component which is a temporary structure for use in assembling and molding the fuel cell. Neither Pflaester nor Fuglevand teach of ***trimming away exterior frame portion of the lead frame to only leave current collector portion of the lead frame***, as claimed by Applicant.

Furthermore, Pflaester, Fuglevand, and Roche do not teach or suggest the use of a ***lead frame*** that ***is designed to use the current collector to protect the protonically conductive membrane and active areas of the diffusion layers of the fuel cell while the molding process takes place***. Applicant's invention uses a temporary frame with permanent current collectors fro fabricating fuel cells. Pflaester merely discloses a sealing

gap that is filled with composite martial to protect the polymer electrolyte membrane. (Pflaester, paragraph 9). A person skilled in the art would not look to a sealing gap to create Applicant's invention because a sealing gap that is filled with too much material during molding process could damage the polymer electrolyte membrane because the material can spread past the set back onto polymer electrolyte membrane. Applicant's invention uses a solid structure for protecting components during molding.

Furthermore, Pflaester teaches away from Applicant's invention by teaching "[E]end plates and tie bolts, which hold together the stack or the fuel cell" (paragraph 46) (emphasis added). Applicant's invention allows the components of the fuel cell to be sealed without the use of screws or bolts.

Accordingly, Applicant respectfully urges that Pflaester, Fuglevand, and Roche, taken alone or in any combination, are legally insufficient to make obvious the presently claimed invention under 35 U.S.C. § 103 because of the absence of the Applicant's claimed novel ***integrating the current collector into said first lead frame component onto which said membrane is placed; placing said lead frame containing said membrane into the mold, wherein the lead frame is designed to use the current collector to protect the protonically conductive membrane and active areas of the diffusion layers of the fuel cell while the molding process takes place; trimming away exterior frame portion of the lead frame to only leave current collector portion of the lead frame.***

At paragraph 9 of the Office Action, claim 6 was rejected under 35 U.S.C. §103 as being unpatentable over Pflaesterer in view of Fuglevand, and in further view of Draper et al., US Patent No. 5,273,838, hereinafter Draper.

Claim 6 includes the limitation "***each lead frame includes a current collector and the current collectors act as compression plates within the fuel cell, ..., placing said lead frame structure containing said membrane sheet into the mold, wherein the lead frame is designed to use the current collector to protect the protonically conductive membrane and active areas of the diffusion layers of the fuel cell while the molding process takes place, ..., trimming away exterior frame portions of each lead frame components to only leave the current collectors extending outward from the fuel cell.***," which as stated above is not taught or suggested by Pflaester and Fuglevand. Additionally, Draper does not disclose or teach a current collector that acts as compression plate and protects the protonically conductive membrane and diffusion layers during molding. Additionally, even with Roche there is no teaching or suggestion in the combination of cited art of trimming away exterior frame portions of each lead frame components to only leave the current collectors extending outward from the fuel cell. Accordingly, the claim is believed to be allowable over the §103 rejection.

At paragraph 10 of the Office Action, claim 8 was rejected under 35 U.S.C. §103 as being unpatentable over Pflaesterer in view of Fuglevand, and in further view of Montminy, US Patent Application No. 2004/0211668, hereinafter Montminy.

Applicant respectfully notes that claim 8 is a dependent claim that depends from an independent claim that is believed to be in condition for allowance. Accordingly, claim 8 is believed to be in condition for allowance.

All independent claims are believed to be in condition for allowance.

All dependent claims are believed to be dependent from allowable independent claims.

Applicant respectfully solicits favorable action

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,

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